PATENT ABSTRACTS OF JAPAN

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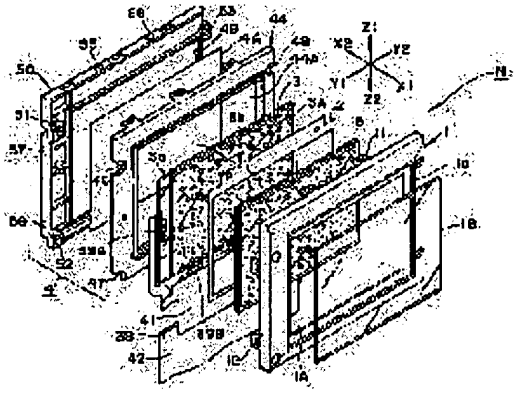
(54) LIQUID CRYSTAL DISPLAY UNIT AND LIQUID CRYSTAL DISPLAY DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To simplify a configuration and facilitate assembly by providing an illumination rear frame with hooks for a front frame, providing the front frame with catcher for being fixed in the hooks for the front frame, fixing the catcher in the hooks for the front frame, and making an illumination unit and a liquid crystal panel into a unit.



SOLUTION: A 2nd liquid crystal display panel 3A is superimposed on a 1st liquid crystal display panel 5 via a spacer 2 and mounted in a front frame. In this case, fixing projections 55, 56 as hooks for fixing the front frame of an illumination unit 4 are fixed in fixing holes of a catcher 11 of the front frame 1, fixing projections 57, 58 as hooks for fixing the front frame of the illumination unit 4 are fixed in fixing holes of a catcher 12, and fixing projections as hooks for fixing the front frame are fixed in a catcher on the other side, respectively. And, FPC 41 connected with front side of the 2nd liquid crystal panel 3A is led out downward, and a substrate 42 is overlaid on the back of the illumination unit 4, and is secured to bosses of the illumination rear side frame 50 by screws to be made into a unit.

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CLAIMS

[Claim(s)]
[Claim 1]A lighting unit which stops after-lighting side frame of each other which stored a fluorescent tube and a light guide member at least to a side frame before lighting which has a lighting window by a locking means.
A liquid crystal display panel.
An attachment part for attaching a picture displayed on said liquid crystal display panel to an observation window and a device main frame for carrying out view **.
It is the liquid crystal display unit provided with the above, a hook for front frames was provided in a side frame after said lighting, a catcher who negotiates with said front frame at said hook for front frames was provided, and unitization of said lighting unit and said liquid crystal display panel was carried out by negotiating with said hook for front frames about said catcher.

[Claim 2]The liquid crystal display unit according to claim 1 which constituted said attachment part from an insertion hole established in a flank of a surface part in which said observation window of said front frame is located, and an insertion hole which was established in said lighting unit and allocated behind said insertion hole.
[Claim 3]The liquid crystal display unit according to claim 1 or 2, wherein a lighting unit supporter which supports said lighting unit is allocated in at least two corners of a stowage of said front frame where said liquid crystal display panel and said lighting unit are stored.
[Claim 4]In at least two sides of a stowage of said front frame where said liquid crystal display panel and said lighting unit are stored. The liquid crystal display unit according to claim 3, wherein ****** for making a projection projected from a device main frame for being arranged ahead of said front frame and supporting said liquid crystal panel penetrate is allocated in at least two places.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to the liquid crystal display unit and liquid crystal display which are seen by the monitor installed in the display monitors for games and bathrooms, such as a pachinko stand, an intercom monitor, the monitor of a plant, etc.
[0002]
[Description of the Prior Art]Since a light weight, small size, a thin shape, and low power consumption are easy to be obtained compared with the display which displays a picture using the conventional Bran Ung pipe, the liquid crystal display which displays a picture with a liquid crystal display panel is used in many fields [monitor apparatus etc.] as a display.
[0003]This conventional kind of liquid crystal display screws to the adapter plate (device main frame) 88 the liquid crystal display unit 87 which stores the liquid crystal display panel 84 and the lighting unit 85 at least to the inside of the front side frame 86-1 and the back side frame 86-2 as shown in drawing 14, and profile composition has been carried out.
[0004]In this case, as shown in the front side frame 86 of said liquid crystal display unit 87 at drawing 15 and drawing 16, the lower edge part is equipped with the fitting part 81 of the shape of a piece of a couple on that surface part 80, respectively.
The back side of the surface part 80 is located in the left of the observation window 82, and the right direction, and the mounting boss part 83 has protruded on it.
It ****s in the left of the lighting unit 85, and a right-hand side part, and the hole 89 is formed.
The lighting unit 85 is attached to the front side frame 86 by screwing the screw-thread member 90 inserted in the screw-thread hole 89 to the mounting boss part 83. The liquid crystal display unit 87 screws the screw-thread member 91 inserted in the screw-thread hole 81A of the fitting part 81 to the adapter plate 88, and has attached it to the adapter plate 88.
[0005]

[Problem(s) to be Solved by the Invention]In attaching the liquid crystal display unit 87 to the adapter plate 88, if it is in the above-mentioned conventional example, are the screw clamp using the fitting part 81 provided in the front side frame 86, and it sets in assembling the liquid crystal display unit 87, The method of screwing to the mounting boss part 83 the screw-thread member 90 which inserted the attachment to the front side frame 86 of the lighting unit 85 in the screw-thread hole 89 of the lighting unit 85 is used,The composition of the mounting part to the adapter plate 88 of the liquid crystal display unit 87 became complicated compositionally, and it had the problem that attachment took a man day.

[0006]Since the space to an overhang of the fitting part 81 which the conventional liquid crystal display unit 87 has is needed, When width arranged two or more liquid crystal display units 87 in the adapter plate 88 and they were attached to it, the interval of the adjacent liquid crystal display unit 87 had to be made large, and there was a problem that attachment of more liquid crystal display units 87 could not be performed.

[0007]

[Means for Solving the Problem]A lighting unit which stops after-lighting side frame of each other in which the feature of this application for solving the above-mentioned technical problem stored a fluorescent tube and a light guide member at least to a side frame before lighting which has a lighting window by a locking means, It has a front frame which has an attachment part for attaching a picture displayed on a liquid crystal display panel and said liquid crystal display panel to an observation window and a device main frame for carrying out view **, In a liquid crystal display unit which allocated said lighting unit and said liquid crystal display panel in said front frame, A hook for front frames was provided in a side frame after said lighting, a catcher who negotiates with said front frame at said hook for front frames was provided, and unitization of said lighting unit and said liquid crystal display panel was carried out by negotiating with said hook for front frames about said catcher.

[0008]Said attachment part consisted of an insertion hole established in a flank of a surface part in which said observation window of said front frame is located, and an insertion hole which was established in said lighting unit and allocated behind said insertion hole.

[0009]A lighting unit supporter which supports said lighting unit is allocated in at least two corners of a stowage of said front frame where said liquid crystal display panel and said lighting unit are stored.

[0010]****** for making at least two sides of a stowage of said front frame where said liquid crystal display panel and said lighting unit are stored penetrate a projection projected from a device main frame for being arranged ahead of said front frame and supporting said liquid crystal panel is allocated in at least two places.

[0011]A spacer was infixed in a periphery of a field where said liquid crystal display panel counters mutually in said liquid crystal unit which has at least two sheets of said liquid crystal

display panel.

[0012]Said spacer was formed by sponge. Said spacer was formed with urethane rubber or a PET material, a PC material, etc. Said spacer was formed with a nonwoven fabric. Said spacer was formed by a double faced adhesive tape.

[0013]By this composition, attach a lighting unit to a front frame, are carrying out unitization directly, without using a back side frame, can carry out by multiplying said catcher by said hook for front frames, and it becomes simple compositionally compared with a case of a screw clamp, and attachment becomes easy.

[0014]A lighting unit which stops after-lighting side frame of each other which stored a fluorescent tube and a light guide member at least to a side frame before lighting which has a lighting window by a locking means, It has a front frame which has an attachment part for attaching a picture displayed on a liquid crystal display panel and said liquid crystal display panel to an observation window and a device main frame for carrying out view **, In a liquid crystal display which attached a liquid crystal display unit which allocated said lighting unit and said liquid crystal display panel in said front frame to said device main frame, Provide a hook for front frames in a side frame after said lighting, and a catcher who negotiates with said front frame at said hook for front frames is provided, An insertion hole established in a flank of a surface part in which unitization of said lighting unit and said liquid crystal display panel is carried out by negotiating with said hook for front frames about said catcher, and said observation window of said front frame is located in said attachment part, By constituting from an insertion hole which was established in said lighting unit and allocated behind said insertion hole, making said insertion hole penetrate a projection projected from said device main frame, contacting said insertion hole, and screwing said lighting unit and said projection. Said device main frame was made to support said liquid crystal display unit.

[0015]By multiplying said catcher by said hook for front frames by this composition, a lighting unit is attached to a front frame and unitization is carried out. For this reason, can remove a back side frame, and composition becomes simple compared with a case where it is a screw clamp, and. When attachment attaches not only becoming easy but a liquid crystal display unit to a device main frame, An insertion hole can be made to be able to penetrate a projection projected from a device main frame, an insertion hole can be contacted, and it can carry out by screwing a lighting unit and a projection, An excessive space to an overhang of a fitting part which the conventional liquid crystal display unit has becomes unnecessary, and when width arranges two or more liquid crystal display units in a device main frame and it attaches them to it, an interval of an adjacent liquid crystal display unit is narrowed, Attachment of more liquid crystal display units can be enabled.

[0016]

[Embodiment of the Invention]Hereafter, an embodiment of the invention is described based on

a drawing. Drawing 1 is a perspective view of a decomposition state in which the liquid crystal display unit concerning this invention carried out the partial abbreviation. Let [X1-X2] a longitudinal direction and Z1-Z2 be sliding directions for a cross direction and Y1-Y2 in a drawing.

[0017]Profile composition of the liquid crystal display unit N concerning this invention has been carried out from the front frame 1, the 1st liquid crystal display panel (correction cell) 5, the spacer 2 and the liquid crystal panel display unit 3 that has the 2nd liquid crystal display panel (driving cell) 3A, and the lighting unit 4. And the panels 68 (drawing 12) for devices, such as a plant, are equipped with this liquid crystal display unit N, and it is used for the monitor as a liquid crystal panel display device, for example.

[0018]The image display window part 1A of the rectangular form as an observation window is formed in the center section of the surface part 1a at said front frame 1. The windshield 1B is inserted in the front-face side of this image display window part 1A.

[0019]As shown in drawing 2 thru/or drawing 6, the front frame 1 And on the surface part 1a, Stand in a row in a margo-inferior part, and also have the left of the undersurface parts 1b and 1c and the surface part 1a, the left which stands in a row in a right-margin-of-heart part, and the right face parts 1d and 1e, and in each edge part of the upper face part 1b and the left, and the right face parts 1d and 1e. Respectively The locking piece parts 11A, 11B, 12A, 12B, and 13A of a couple, 13B is formed, the locking holes 11a, 11b, 12a, 12b, 13a, and 13b are formed in these locking piece parts 11A, 11B, 12A, 12B, 13A, and 13B, and the catchers 11, 12, and 13 consist of these.

[0020]The seat part 61 is formed in the rear-face side of the surface part 1a of said front frame 1. The bottom parts [this seat part 61 is located in back before said image display window part 1A in the rear-face side of said surface part 1a, and also] 14A and 14B, It is considered as the left of said image display window part 1A, the left located in the right direction, and the right-hand side parts 14C and 14D, The upper part part 14A and the left-hand side part 14C the corner to accomplish The 1st corner 15A, The upper part part 14A and the right-hand side part 14D the corner to accomplish The 2nd corner 15B, The bottom part 14B and the left-hand side part 14C the corner to accomplish The 3rd corner 15C, When the corner which the bottom part 14B and the right-hand side part 14D accomplish is made into the 4th corner 15D, The 1st and 2nd gage pin parts 16 and 17 to the 1st corner 15A at the 2nd corner 15B the 3rd and 4th gage pin parts 18 and 19, The 5th and 6th gage pin parts 20 and 21 are protruded on the 3rd corner 15C, the 7th and 8th gage pin parts 22 and 23 are protruded on the 4th corner 15D, respectively, and it constitutes.

[0021]The pin shape spacer part 24 protrudes on the 3rd corner 15C, the pin shape spacer parts 25 and 26 have protruded on the upper and lower sides of said left-hand side part 14C, respectively, and the pin parts 27 and 28 for an elastic spacer stop have protruded on the right

and left of said upper part part 14A.

[0022]The insertion holes 29 and 30 provide in the upper and lower sides of the left-hand side part 14C, and the insertion holes 31 and 32 are established in the upper and lower sides of the right-hand side part 14D, respectively, In a corner, three of the rear faces of the surface part 1a of the front frame 1 The holder parts 33A and 33B, 33C is provided, respectively, the lighting unit 4 is supported by these holder parts 33A, 33B, and 33C and pin shape spacer parts 24, 25, and 26, and the composition of supporting and positioning the liquid crystal panel unit 3 in the 1st - the 8th gage pin parts 16-23 is made.

[0023]Press punching of a sponge material like tabular urethane foam is carried out to the frame-like object of rectangular form, said elastic spacer 2 is fabricated, as shown in drawing 7, 35 has accomplished at least that upper section broadly and the locking holes 36 and 37 are formed in the left of 35, and the right at least for this upper section. The construction material of this elastic spacer 2 may be not only a sponge material like urethane foam but urethane rubber, and a nonwoven fabric, and may constitute elastic spacer 2 the very thing from a double faced adhesive tape.

[0024]Said liquid crystal display unit 3 is provided with the following.

Liquid crystal display panel 3A.

The drive control section 3B of the liquid crystal display panel 3A.

The liquid crystal display panel 3A encloses liquid crystal material (not shown) between the upper transparent substrate 3a and the lower transparent substrate 3b. The signal electrode driving circuit unit 39A and the scanning electrode driving circuit unit 39B are formed in the liquid crystal display panel 3A, respectively. And the flat cable (FPC) 41 for supplying a driving control signal to the signal electrode driving circuit unit 39A and the scanning electrode driving circuit unit 39B is connected to the transparent substrate of the liquid crystal display panel 3A.

[0025]The terminal connected to the 2nd liquid crystal display panel 3A and the terminal of FPC41 of an opposite hand are connected to the substrate 42 with which the electronic parts for the drive controlling of the 2nd liquid crystal display panel 3A (not shown) were mounted.

[0026]As shown in drawing 1 and drawing 8 thru/or drawing 11, the lighting unit 4 a fluorescent tube (not shown), a light guide member (not shown), the diffusion board 4B, and the prism sheet 4A, An inner surface stores to the after-lighting side frame 50 by which reflection processing was carried out, the side frame 44 before lighting which has the lighting window 44A ahead of the side frame 50 after this lighting is allocated, and the after-lighting side frame 50 and the side frame 44 before lighting of each other are stopped, and consist of locking means (a hook and a catcher).

[0027]And the notches 46, 47, 48, and 49 are formed in the upper and lower sides of the side frame 44L before lighting, and the right-hand side part 44R, respectively. The heights 51, 52, 53, and 54 of the shape corresponding to said notches 46, 47, 48, and 49 are formed in the

upper and lower sides left-hand side and on the right-hand side of the front part of the side frame 50 after said lighting, respectively. And the insertion holes 51a, 52a, 53a, and 54a are formed in these heights 51, 52, 53, and 54, and the reverse side of the heights 51, 52, 53, and 54 is accomplished to the screw-thread seat 51b, 52b, 53b, and 54b. The three boss sections 43 for screwing the substrate 42 are formed in the rear face of the side frame 50 after said lighting.

[0028]The lock projections 55 and 56 as a hook for a front frame stop are formed in right and left, you make it located in the left of the after-lighting side frame 50, and the right end surface parts 50C and 50D up and down, and the lock projections 57, 58, 59, and 60 as a hook for a front frame stop are formed in the upper bed surface part 50A of the after-lighting side frame 50 at them.

[0029]And the 1st liquid crystal display panel 5 is accommodated in the seat part 61 of the front frame 1. In this case, the 1st corner 5A of the 1st liquid crystal display panel 5 is positioned by the 1st and 2nd gage pin parts 16 and 17 of the 1st corner 15A of the front frame 1, and the 2nd corner 5B of the 1st liquid crystal display panel 5 is positioned by the 3rd and 4th gage pin parts 18 and 19 of the 2nd corner 15B. The 3rd corner 5C of the 1st liquid crystal display panel 5 is positioned by the 5th and 6th gage pin parts 20 and 21 of the 3rd corner 15C. The 4th corner 5D of the 1st liquid crystal display panel 5 is positioned by the 7th and 8th gage pin parts 22 and 23 of the 4th corner 15D.

[0030]And the spacer 2 is formed in the 1st liquid crystal display panel 5 in piles, and the insertion stop of the pin parts 27 and 28 for a spacer stop is carried out in the left of the upper part part 35 of this spacer 2, and the right locking holes 36 and 37.

[0031]And the 1st liquid crystal display panel 5 is equipped with the 2nd liquid crystal display panel 3A in piles via the spacer 2 at the front frame 1. In this case, to the locking holes 11a and 11b of the catcher 11 of the front frame 1 the lock projections 55 and 56 as a hook for a front frame stop of the lighting unit 4, The lock projections 57 and 58 as a hook for a front frame stop of the lighting unit 4 are stopped by the catcher's 12 locking holes 12a and 12b, and the lock projections 59 and 60 as a hook for a front frame stop of the ****** unit 3 are stopped by the catcher's 13 locking holes 13a and 13b, respectively.

[0032]And FPC41 connected to the side front of the 2nd liquid crystal display panel 3A is bent, and it draws caudad, The substrate 42 puts on the back side of the lighting unit 4, and ****s the fitting part (not shown) provided in the right and left of the lower edge part of the substrate 42, and it is a member. (not shown) Unitization has been screwed and carried out to the boss section 43 of the after-lighting side frame 50.

[0033]And liquid crystal display unit N by which unitization was carried out in this way is screwed to the device main frame 68. Namely, as shown in this device main frame 68 at drawing 12, the image display window part 69 of rectangular form is formed in the center

section of that surface part 68A, It is made to be located up and down, and it has protruded, the projection 70 ****s in the end face of these projections 70, and the hole 71 is formed in the left and the right-hand side part which inserted the image display window part 69 of the device main frame 68 into inside.

[0034]And the projection 70 of the device main frame 68 is inserted in the insertion holes 29, 30, 31, and 32 of the front frame 1 of liquid crystal display unit N, and liquid crystal display unit N is made to meet the back side of the device main frame 68. Next, the screw-thread seat 51b, 52b, 53b, and 54b and the screw-thread hole 71 of the end face of the projection 70 which were allocated by the after-lighting side frame 50 are screwed by the screw-thread member 72 inserted in the insertion holes 51a, 52a, 53a, and 54a allocated by the after-lighting side frame 50. Thus, liquid crystal display unit N is screwed to said device main frame 68, and a liquid crystal display is constituted. In this case, the image display window part 1A of said front frame 1 laps with the image display window part 69 of the surface part 68A of the device main frame 68.

[0035]

[Effect of the Invention]According to the liquid crystal display unit concerning this invention, like the above, the hook for front frames is provided in an after-lighting side frame, By having provided the catcher who negotiates with said hook for front frames in the front frame, and having carried out unitization of said lighting unit and said liquid crystal display panel by negotiating with said hook for front frames about said catcher, When attaching a lighting unit to a front frame and carrying out unitization, can carry out by multiplying said catcher by said hook for front frames, and it becomes simple compositionally compared with the case of a screw clamp, and attachment becomes easy.

[0036]The insertion hole established in the flank of the surface part in which said observation window of a front frame is located in the attachment part for attaching a liquid crystal display unit to a device main frame, By constituting from an insertion hole which was established in the lighting unit and allocated behind said insertion hole, making said insertion hole penetrate the projection projected from said device main frame, contacting said insertion hole, and screwing said lighting unit and said projection. When attaching a liquid crystal display unit to a device main frame by having made said device main frame support said liquid crystal display unit, An insertion hole can be made to be able to penetrate the projection projected from the device main frame, an insertion hole can be contacted, and it can carry out by screwing a lighting unit and a projection, The excessive space to an overhang of the fitting part which the conventional liquid crystal display unit has becomes unnecessary, and when width arranges two or more liquid crystal display units in a device main frame and it attaches them to it, the interval of an adjacent liquid crystal display unit is narrowed, Attachment of more liquid crystal display units can be enabled.

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TECHNICAL FIELD

[Field of the Invention]This invention relates to the liquid crystal display unit and liquid crystal display which are seen by the monitor installed in the display monitors for games and bathrooms, such as a pachinko stand, an intercom monitor, the monitor of a plant, etc.

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PRIOR ART

[Description of the Prior Art]Since a light weight, small size, a thin shape, and low power consumption are easy to be obtained compared with the display which displays a picture using the conventional Bran Ung pipe, the liquid crystal display which displays a picture with a liquid crystal display panel is used in many fields [monitor apparatus etc.] as a display.
[0003]This conventional kind of liquid crystal display screws to the adapter plate (device main frame) 88 the liquid crystal display unit 87 which stores the liquid crystal display panel 84 and the lighting unit 85 at least to the inside of the front side frame 86-1 and the back side frame 86-2 as shown in drawing 14, and profile composition has been carried out.
[0004]In this case, as shown in the front side frame 86 of said liquid crystal display unit 87 at drawing 15 and drawing 16, the lower edge part is equipped with the fitting part 81 of the shape of a piece of a couple on that surface part 80, respectively.
The back side of the surface part 80 is located in the left of the observation window 82, and the right direction, and the mounting boss part 83 has protruded on it.
It ****s in the left of the lighting unit 85, and a right-hand side part, and the hole 89 is formed.
The lighting unit 85 is attached to the front side frame 86 by screwing the screw-thread member 90 inserted in the screw-thread hole 89 to the mounting boss part 83. The liquid crystal display unit 87 screws the screw-thread member 91 inserted in the screw-thread hole 81A of the fitting part 81 to the adapter plate 88, and has attached it to the adapter plate 88.

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EFFECT OF THE INVENTION

[Effect of the Invention]According to the liquid crystal display unit concerning this invention, like the above, the hook for front frames is provided in an after-lighting side frame, By having provided the catcher who negotiates with said hook for front frames in the front frame, and having carried out unitization of said lighting unit and said liquid crystal display panel by negotiating with said hook for front frames about said catcher, When attaching a lighting unit to a front frame and carrying out unitization, can carry out by multiplying said catcher by said hook for front frames, and it becomes simple compositionally compared with the case of a screw clamp, and attachment becomes easy.
[0036]The insertion hole established in the flank of the surface part in which said observation window of a front frame is located in the attachment part for attaching a liquid crystal display unit to a device main frame, By constituting from an insertion hole which was established in the lighting unit and allocated behind said insertion hole, making said insertion hole penetrate the projection projected from said device main frame, contacting said insertion hole, and screwing said lighting unit and said projection. When attaching a liquid crystal display unit to a device main frame by having made said device main frame support said liquid crystal display unit, An insertion hole can be made to be able to penetrate the projection projected from the device main frame, an insertion hole can be contacted, and it can carry out by screwing a lighting unit and a projection, The excessive space to an overhang of the fitting part which the conventional liquid crystal display unit has becomes unnecessary, and when width arranges two or more liquid crystal display units in a device main frame and it attaches them to it, the interval of an adjacent liquid crystal display unit is narrowed, Attachment of more liquid crystal display units can be enabled.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention]In attaching the liquid crystal display unit 87 to the adapter plate 88, if it is in the above-mentioned conventional example, are the screw clamp using the fitting part 81 provided in the front side frame 86, and it sets in assembling the liquid crystal display unit 87, The method of screwing to the mounting boss part 83 the screw-thread member 90 which inserted the attachment to the front side frame 86 of the lighting unit 85 in the screw-thread hole 89 of the lighting unit 85 is used,The composition of the mounting part to the adapter plate 88 of the liquid crystal display unit 87 became complicated compositionally, and it had the problem that attachment took a man day.
[0006]Since the space to an overhang of the fitting part 81 which the conventional liquid crystal display unit 87 has is needed, When width arranged two or more liquid crystal display units 87 in the adapter plate 88 and they were attached to it, the interval of the adjacent liquid crystal display unit 87 had to be made large, and there was a problem that attachment of more liquid crystal display units 87 could not be performed.

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MEANS

[Means for Solving the Problem]A lighting unit which stops after-lighting side frame of each other in which the feature of this application for solving the above-mentioned technical problem stored a fluorescent tube and a light guide member at least to a side frame before lighting which has a lighting window by a locking means, It has a front frame which has an attachment part for attaching a picture displayed on a liquid crystal display panel and said liquid crystal display panel to an observation window and a device main frame for carrying out view **, In a liquid crystal display unit which allocated said lighting unit and said liquid crystal display panel in said front frame, A hook for front frames was provided in a side frame after said lighting, a catcher who negotiates with said front frame at said hook for front frames was provided, and unitization of said lighting unit and said liquid crystal display panel was carried out by negotiating with said hook for front frames about said catcher.
[0008]Said attachment part consisted of an insertion hole established in a flank of a surface part in which said observation window of said front frame is located, and an insertion hole which was established in said lighting unit and allocated behind said insertion hole.
[0009]A lighting unit supporter which supports said lighting unit is allocated in at least two corners of a stowage of said front frame where said liquid crystal display panel and said lighting unit are stored.
[0010]****** for making at least two sides of a stowage of said front frame where said liquid crystal display panel and said lighting unit are stored penetrate a projection projected from a device main frame for being arranged ahead of said front frame and supporting said liquid crystal panel is allocated in at least two places.
[0011]A spacer was infixed in a periphery of a field where said liquid crystal display panel counters mutually in said liquid crystal unit which has at least two sheets of said liquid crystal display panel.
[0012]Said spacer was formed by sponge. Said spacer was formed with urethane rubber or a

PET material, a PC material, etc. Said spacer was formed with a nonwoven fabric. Said spacer was formed by a double faced adhesive tape.

[0013]By this composition, attach a lighting unit to a front frame, are carrying out unitization directly, without using a back side frame, can carry out by multiplying said catcher by said hook for front frames, and it becomes simple compositionally compared with a case of a screw clamp, and attachment becomes easy.

[0014]A lighting unit which stops after-lighting side frame of each other which stored a fluorescent tube and a light guide member at least to a side frame before lighting which has a lighting window by a locking means, It has a front frame which has an attachment part for attaching a picture displayed on a liquid crystal display panel and said liquid crystal display panel to an observation window and a device main frame for carrying out view **, In a liquid crystal display which attached a liquid crystal display unit which allocated said lighting unit and said liquid crystal display panel in said front frame to said device main frame, Provide a hook for front frames in a side frame after said lighting, and a catcher who negotiates with said front frame at said hook for front frames is provided, An insertion hole established in a flank of a surface part in which unitization of said lighting unit and said liquid crystal display panel is carried out by negotiating with said hook for front frames about said catcher, and said observation window of said front frame is located in said attachment part, By constituting from an insertion hole which was established in said lighting unit and allocated behind said insertion hole, making said insertion hole penetrate a projection projected from said device main frame, contacting said insertion hole, and screwing said lighting unit and said projection. Said device main frame was made to support said liquid crystal display unit.

[0015]By multiplying said catcher by said hook for front frames by this composition, a lighting unit is attached to a front frame and unitization is carried out. For this reason, can remove a back side frame, and composition becomes simple compared with a case where it is a screw clamp, and. When attachment attaches not only becoming easy but a liquid crystal display unit to a device main frame, An insertion hole can be made to be able to penetrate a projection projected from a device main frame, an insertion hole can be contacted, and it can carry out by screwing a lighting unit and a projection, An excessive space to an overhang of a fitting part which the conventional liquid crystal display unit has becomes unnecessary, and when width arranges two or more liquid crystal display units in a device main frame and it attaches them to it, an interval of an adjacent liquid crystal display unit is narrowed, Attachment of more liquid crystal display units can be enabled.

[0016]

[Embodiment of the Invention]Hereafter, an embodiment of the invention is described based on a drawing. Drawing 1 is a perspective view of a decomposition state in which the liquid crystal display unit concerning this invention carried out the partial abbreviation. Let [X1-X2] a

longitudinal direction and Z1-Z2 be sliding directions for a cross direction and Y1-Y2 in a drawing.

[0017]Profile composition of the liquid crystal display unit N concerning this invention has been carried out from the front frame 1, the 1st liquid crystal display panel (correction cell) 5, the spacer 2 and the liquid crystal panel display unit 3 that has the 2nd liquid crystal display panel (driving cell) 3A, and the lighting unit 4. And the panels 68 (drawing 12) for devices, such as a plant, are equipped with this liquid crystal display unit N, and it is used for the monitor as a liquid crystal panel display device, for example.

[0018]The image display window part 1A of the rectangular form as an observation window is formed in the center section of the surface part 1a at said front frame 1. The windshield 1B is inserted in the front-face side of this image display window part 1A.

[0019]As shown in drawing 2 thru/or drawing 6, the front frame 1 And on the surface part 1a, Stand in a row in a margo-inferior part, and also have the left of the undersurface parts 1b and 1c and the surface part 1a, the left which stands in a row in a right-margin-of-heart part, and the right face parts 1d and 1e, and in each edge part of the upper face part 1b and the left, and the right face parts 1d and 1e. Respectively The locking piece parts 11A, 11B, 12A, 12B, and 13A of a couple, 13B is formed, the locking holes 11a, 11b, 12a, 12b, 13a, and 13b are formed in these locking piece parts 11A, 11B, 12A, 12B, 13A, and 13B, and the catchers 11, 12, and 13 consist of these.

[0020]The seat part 61 is formed in the rear-face side of the surface part 1a of said front frame 1. The bottom parts [this seat part 61 is located in back before said image display window part 1A in the rear-face side of said surface part 1a, and also] 14A and 14B, It is considered as the left of said image display window part 1A, the left located in the right direction, and the right-hand side parts 14C and 14D, The upper part part 14A and the left-hand side part 14C the corner to accomplish The 1st corner 15A, The upper part part 14A and the right-hand side part 14D the corner to accomplish The 2nd corner 15B, The bottom part 14B and the left-hand side part 14C the corner to accomplish The 3rd corner 15C, When the corner which the bottom part 14B and the right-hand side part 14D accomplish is made into the 4th corner 15D, The 1st and 2nd gage pin parts 16 and 17 to the 1st corner 15A at the 2nd corner 15B the 3rd and 4th gage pin parts 18 and 19, The 5th and 6th gage pin parts 20 and 21 are protruded on the 3rd corner 15C, the 7th and 8th gage pin parts 22 and 23 are protruded on the 4th corner 15D, respectively, and it constitutes.

[0021]The pin shape spacer part 24 protrudes on the 3rd corner 15C, the pin shape spacer parts 25 and 26 have protruded on the upper and lower sides of said left-hand side part 14C, respectively, and the pin parts 27 and 28 for an elastic spacer stop have protruded on the right and left of said upper part part 14A.

[0022]The insertion holes 29 and 30 provide in the upper and lower sides of the left-hand side

part 14C, and the insertion holes 31 and 32 are established in the upper and lower sides of the right-hand side part 14D, respectively, In a corner, three of the rear faces of the surface part 1a of the front frame 1 The holder parts 33A and 33B, 33C is provided, respectively, the lighting unit 4 is supported by these holder parts 33A, 33B, and 33C and pin shape spacer parts 24, 25, and 26, and the composition of supporting and positioning the liquid crystal panel unit 3 in the 1st - the 8th gage pin parts 16-23 is made.

[0023]Press punching of a sponge material like tabular urethane foam is carried out to the frame-like object of rectangular form, said elastic spacer 2 is fabricated, as shown in drawing 7, 35 has accomplished at least that upper section broadly and the locking holes 36 and 37 are formed in the left of 35, and the right at least for this upper section. The construction material of this elastic spacer 2 may be not only a sponge material like urethane foam but urethane rubber, and a nonwoven fabric, and may constitute elastic spacer 2 the very thing from a double faced adhesive tape.

[0024]Said liquid crystal display unit 3 is provided with the following.

Liquid crystal display panel 3A.

The drive control section 3B of the liquid crystal display panel 3A.

The liquid crystal display panel 3A encloses liquid crystal material (not shown) between the upper transparent substrate 3a and the lower transparent substrate 3b. The signal electrode driving circuit unit 39A and the scanning electrode driving circuit unit 39B are formed in the liquid crystal display panel 3A, respectively. And the flat cable (FPC) 41 for supplying a driving control signal to the signal electrode driving circuit unit 39A and the scanning electrode driving circuit unit 39B is connected to the transparent substrate of the liquid crystal display panel 3A.

[0025]The terminal connected to the 2nd liquid crystal display panel 3A and the terminal of FPC41 of an opposite hand are connected to the substrate 42 with which the electronic parts for the drive controlling of the 2nd liquid crystal display panel 3A (not shown) were mounted.

[0026]As shown in drawing 1 and drawing 8 thru/or drawing 11, the lighting unit 4 a fluorescent tube (not shown), a light guide member (not shown), the diffusion board 4B, and the prism sheet 4A, An inner surface stores to the after-lighting side frame 50 by which reflection processing was carried out, the side frame 44 before lighting which has the lighting window 44A ahead of the side frame 50 after this lighting is allocated, and the after-lighting side frame 50 and the side frame 44 before lighting of each other are stopped, and consist of locking means (a hook and a catcher).

[0027]And the notches 46, 47, 48, and 49 are formed in the upper and lower sides of the side frame 44L before lighting, and the right-hand side part 44R, respectively. The heights 51, 52, 53, and 54 of the shape corresponding to said notches 46, 47, 48, and 49 are formed in the upper and lower sides left-hand side and on the right-hand side of the front part of the side frame 50 after said lighting, respectively. And the insertion holes 51a, 52a, 53a, and 54a are

formed in these heights 51, 52, 53, and 54, and the reverse side of the heights 51, 52, 53, and 54 is accomplished to the screw-thread seat 51b, 52b, 53b, and 54b. The three boss sections 43 for screwing the substrate 42 are formed in the rear face of the side frame 50 after said lighting.

[0028]The lock projections 55 and 56 as a hook for a front frame stop are formed in right and left, you make it located in the left of the after-lighting side frame 50, and the right end surface parts 50C and 50D up and down, and the lock projections 57, 58, 59, and 60 as a hook for a front frame stop are formed in the upper bed surface part 50A of the after-lighting side frame 50 at them.

[0029]And the 1st liquid crystal display panel 5 is accommodated in the seat part 61 of the front frame 1. In this case, the 1st corner 5A of the 1st liquid crystal display panel 5 is positioned by the 1st and 2nd gage pin parts 16 and 17 of the 1st corner 15A of the front frame 1, and the 2nd corner 5B of the 1st liquid crystal display panel 5 is positioned by the 3rd and 4th gage pin parts 18 and 19 of the 2nd corner 15B. The 3rd corner 5C of the 1st liquid crystal display panel 5 is positioned by the 5th and 6th gage pin parts 20 and 21 of the 3rd corner 15C. The 4th corner 5D of the 1st liquid crystal display panel 5 is positioned by the 7th and 8th gage pin parts 22 and 23 of the 4th corner 15D.

[0030]And the spacer 2 is formed in the 1st liquid crystal display panel 5 in piles, and the insertion stop of the pin parts 27 and 28 for a spacer stop is carried out in the left of the upper part part 35 of this spacer 2, and the right locking holes 36 and 37.

[0031]And the 1st liquid crystal display panel 5 is equipped with the 2nd liquid crystal display panel 3A in piles via the spacer 2 at the front frame 1. In this case, to the locking holes 11a and 11b of the catcher 11 of the front frame 1 the lock projections 55 and 56 as a hook for a front frame stop of the lighting unit 4, The lock projections 57 and 58 as a hook for a front frame stop of the lighting unit 4 are stopped by the catcher's 12 locking holes 12a and 12b, and the lock projections 59 and 60 as a hook for a front frame stop of the ****** unit 3 are stopped by the catcher's 13 locking holes 13a and 13b, respectively.

[0032]And FPC41 connected to the side front of the 2nd liquid crystal display panel 3A is bent, and it draws caudad, The substrate 42 puts on the back side of the lighting unit 4, and ****s the fitting part (not shown) provided in the right and left of the lower edge part of the substrate 42, and it is a member. (not shown) Unitization has been screwed and carried out to the boss section 43 of the after-lighting side frame 50.

[0033]And liquid crystal display unit N by which unitization was carried out in this way is screwed to the device main frame 68. Namely, as shown in this device main frame 68 at drawing 12, the image display window part 69 of rectangular form is formed in the center section of that surface part 68A, It is made to be located up and down, and it has protruded, the projection 70 ****s in the end face of these projections 70, and the hole 71 is formed in the

left and the right-hand side part which inserted the image display window part 69 of the device main frame 68 into inside.

[0034]And the projection 70 of the device main frame 68 is inserted in the insertion holes 29, 30, 31, and 32 of the front frame 1 of liquid crystal display unit N, and liquid crystal display unit N is made to meet the back side of the device main frame 68. Next, the screw-thread seat 51b, 52b, 53b, and 54b and the screw-thread hole 71 of the end face of the projection 70 which were allocated by the after-lighting side frame 50 are screwed by the screw-thread member 72 inserted in the insertion holes 51a, 52a, 53a, and 54a allocated by the after-lighting side frame 50. Thus, liquid crystal display unit N is screwed to said device main frame 68, and a liquid crystal display is constituted. In this case, the image display window part 1A of said front frame 1 laps with the image display window part 69 of the surface part 68A of the device main frame 68.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]It is a perspective view of a decomposition state of the liquid crystal display unit concerning this invention.
[Drawing 2]It is a front view of the front frame of the liquid crystal display unit.
[Drawing 3]It is a view figure from [of drawing 2] A.
[Drawing 4]It is a view figure from [of drawing 2] B.
[Drawing 5]It is a view figure from [of drawing 2] C.
[Drawing 6]It is a back view of the front frame of the liquid crystal display unit.
[Drawing 7]It is a front view of the elastic spacer of the liquid crystal display unit.
[Drawing 8]It is a front view of the lighting unit of the liquid crystal display unit.
[Drawing 9]It is a view figure from [of drawing 8] D.
[Drawing 10]It is a view figure from [of drawing 9] E.
[Drawing 11]It is a view figure from [of drawing 9] F.
[Drawing 12]It is a perspective view of the mounting state of the liquid crystal display concerning this invention.
[Drawing 13]It is a sectional view of the mounting state of the liquid crystal display.
[Drawing 14]It is a sectional view of the conventional liquid crystal display.
[Drawing 15]It is a perspective view of the front frame of the liquid crystal display.
[Drawing 16]It is the perspective view seen from the back side of the front frame of the liquid crystal display.
[Description of Notations]
1 Front frame
2 Elastic spacer
3 Liquid crystal display panel
3A The 2nd liquid crystal panel

4 Lighting unit
5 The 1st liquid crystal panel
11, 12, and 13 Catcher
29-32 Insertion hole
50 After-lighting side frame
51a-54a Insertion hole
55-60 Lock projection (hook for a front frame stop)
68 Device main frame
70 Projection
N Liquid crystal display unit

[Translation done.]

* NOTICES *

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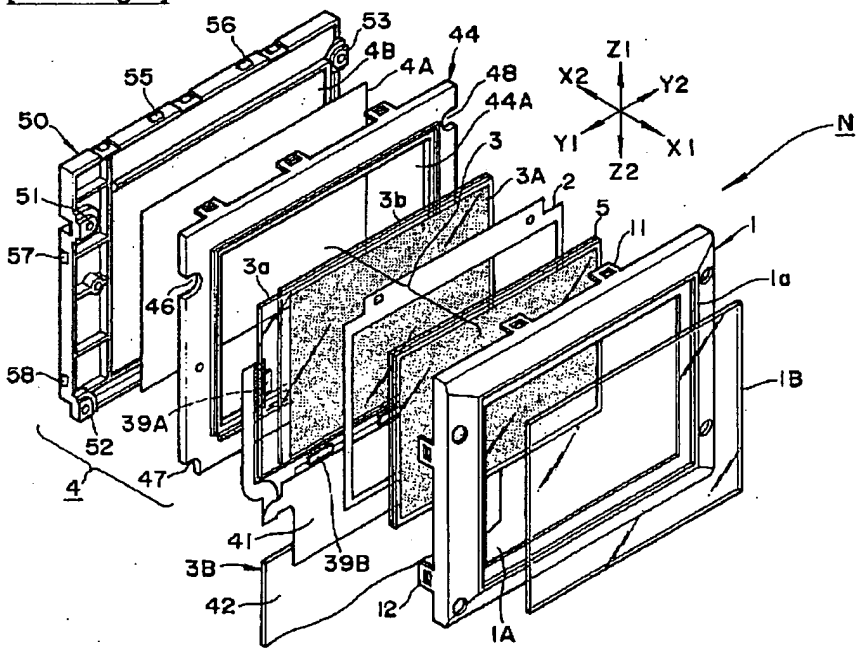
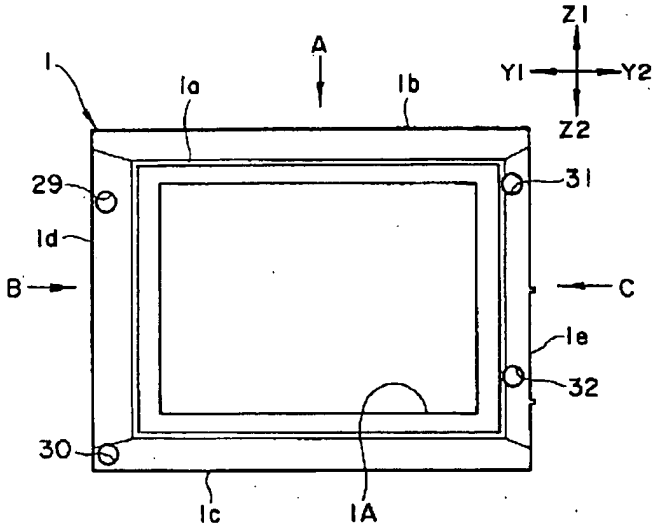
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

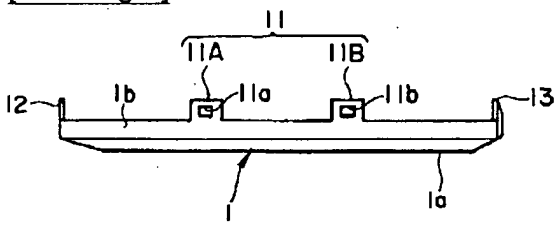
[Drawing 1]



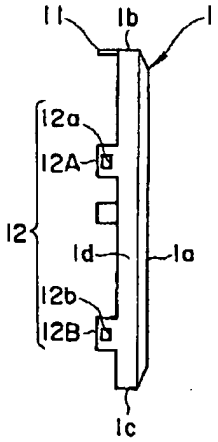
[Drawing 2]



[Drawing 3]



[Drawing 4]



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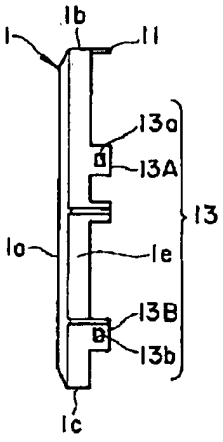
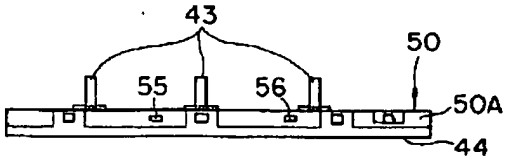
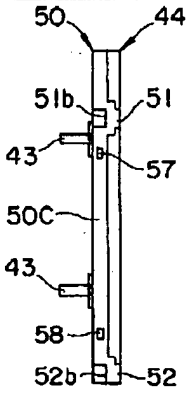


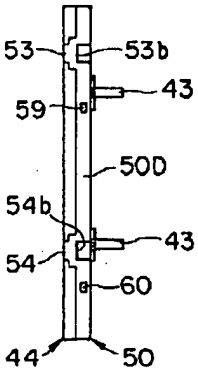
[Drawing 9]



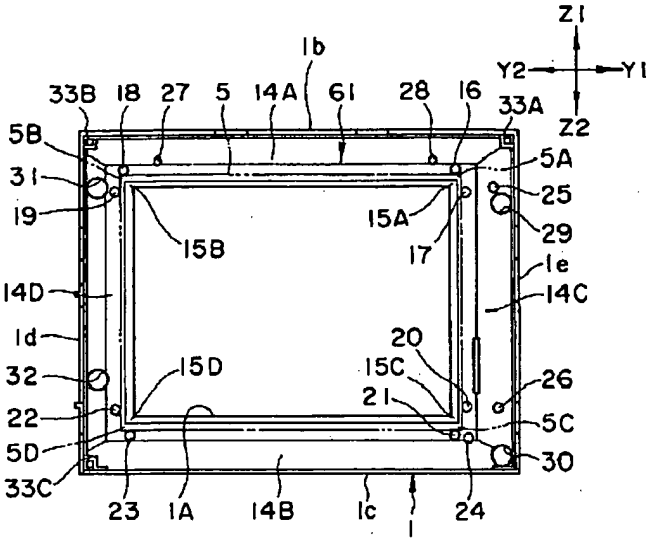
[Drawing 10]



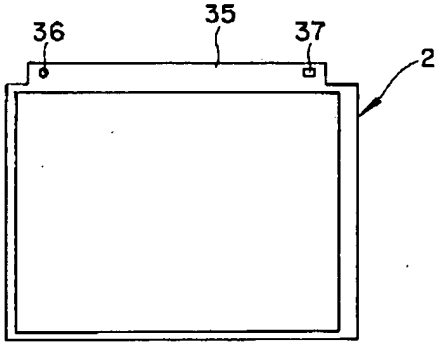
[Drawing 11]



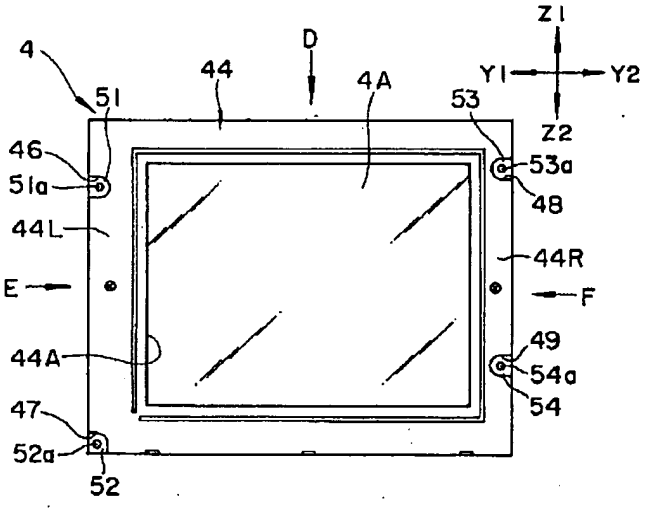
[Drawing 6]



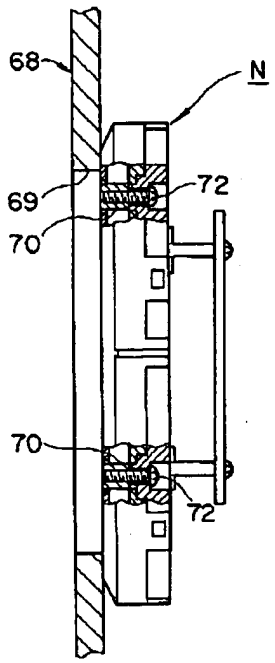
[Drawing 7]



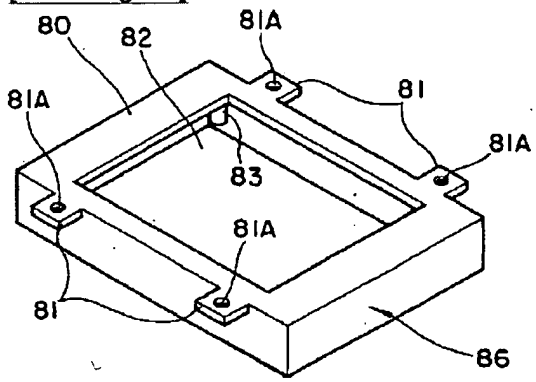
[Drawing 8]



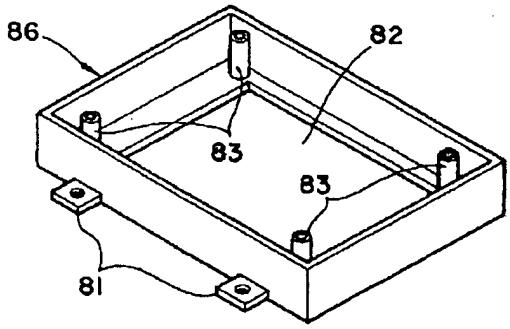
[Drawing 13]



[Drawing 15]



[Drawing 16]



[Drawing 12]

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Ｇ０９Ｆ	9/00	３５０	Ｇ０９Ｆ	9/00	３５０Ｚ

審査請求　未請求　請求項の数10　ＯＬ　（全８頁）

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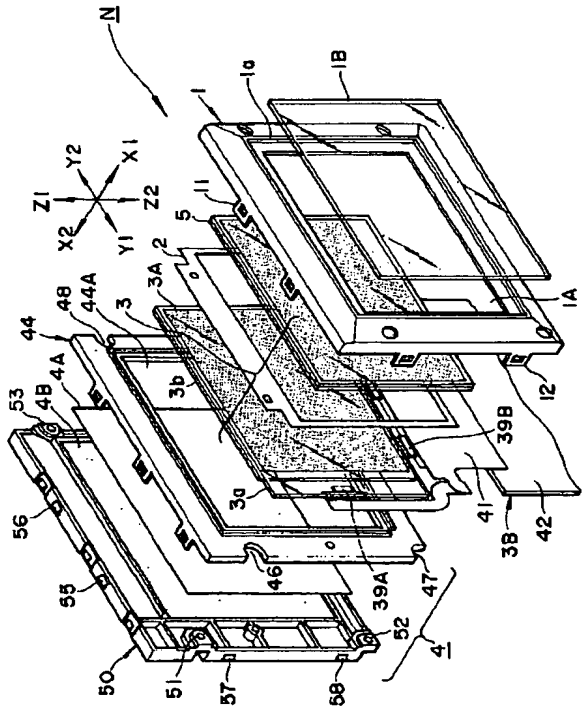
(54)【発明の名称】　液晶表示ユニット及び液晶表示装置

(57)【要約】

【課題】　複数の液晶表示ユニットの装置本体への取付時に、隣り合う液晶表示ユニットの間隔を狭くなし得て、より多くの液晶表示ユニットの取付けを可能にする液晶表示装置を提供する。

【解決手段】　照明後側枠に係止突起５５～６０を設け前枠１に係止突起に掛合するキャッチャ１１、１２、１３を設け係止突起５５～６０にキャッチャ１１、１２、１３を掛合せすることにより照明ユニット４を前枠１に取付けを行い液晶表示ユニットを形成することで表示ユニットの下枠を削減する。また液晶表示ユニットＮを装置本体６８に取り付ける場合には、組付け部を、前枠１の挿通孔２９～３２と、照明ユニット４に設けられた挿入孔５１ａ～５４ａとから構成し装置本体６８から突出した突起７０を挿通孔２９～３２に貫通させて挿入孔５１ａ～５４ａに当接し照明ユニット４と突起７０をねじ止めすることにより行う。



【特許請求の範囲】
【請求項１】　照明窓を有する照明前側枠に、少なくとも蛍光管と導光部材とを収納した照明後側枠を係止手段により互いに係止して成る照明ユニットと、液晶表示パネルと、前記液晶表示パネルに表示された画像を観視するための観視窓と装置本体に組み付けるための組付け部とを有する前枠とを有して、前記前枠に前記照明ユニットと前記液晶表示パネルとを配設した液晶表示ユニットにおいて、
前記照明後側枠に前枠用フックを設け、前記前枠に前記前枠用フックに掛合するキャッチャを設け、前記前枠用フックに前記キャッチャを掛合することで前記照明ユニットと前記液晶表示パネルとをユニット化したことを特徴とする液晶表示ユニット。
【請求項２】　前記組付け部を、前記前枠の前記観視窓が位置する面部の側部に設けられた挿通孔と、前記照明ユニットに設けられて前記挿通孔の後方に配設された挿入孔とから構成した請求項１に記載の液晶表示ユニット。
【請求項３】　前記液晶表示パネルと前記照明ユニットが収納される前記前枠の収納部の少なくとも２箇所の隅には、前記照明ユニットを支持する照明ユニット支持部が配設されていることを特徴とする請求項１又は請求項２に記載の液晶表示ユニット。
【請求項４】　前記液晶表示パネルと前記照明ユニットが収納される前記前枠の収納部の少なくとも２辺には、前記前枠の前方に配置され前記液晶パネルを支持するための装置本体から突出した突起を貫通させるための押通孔が少なくとも２箇所に配設されていることを特徴とする請求項３に記載の液晶表示ユニット。
【請求項５】　前記液晶表示パネルを少なくとも２枚有する前記液晶ユニットにおいて、前記液晶表示パネルが互いに対向する面の周辺部にスペーサを介装した請求項１又は請求項２又は請求項３又は請求項４に記載の液晶表示ユニット。
【請求項６】　前記スペーサをスポンジで形成した請求項５に記載の液晶表示ユニット。
【請求項７】　前記スペーサをウレタンゴムまたはＰＥＴ材やＰＣ材等で形成したことを特徴とする請求項５に記載の液晶表示ユニット。
【請求項８】　前記スペーサを不織布で形成した請求項５に記載の液晶表示ユニット。
【請求項９】　前記スペーサを両面接着テープで形成した請求項５に記載の液晶表示ユニット。
【請求項１０】　照明窓を有する照明前側枠に、少なくとも蛍光管と導光部材とを収納した照明後側枠を係止手段により互いに係止して成る照明ユニットと、液晶表示パネルと、前記液晶表示パネルに表示された画像を観視するための観視窓と装置本体に組み付けるための組付け部とを有する前枠とを有して、前記前枠に前記照明ユニットと前記液晶表示パネルとを配設した液晶表示ユニットを前記装置本体に組付けた液晶表示装置において、
前記照明後側枠に前枠用フックを設け、前記前枠に前記前枠用フックに掛合するキャッチャを設け、前記前枠用フックに前記キャッチャを掛合することで前記照明ユニットと前記液晶表示パネルとをユニット化し、
前記組付け部を、前記前枠の前記観視窓が位置する面部の側部に設けられた挿通孔と、前記照明ユニットに設けられて前記挿通孔の後方に配設された挿入孔とから構成し、前記装置本体から突出した突起を前記挿通孔に貫通させて前記挿入孔に当接し、前記照明ユニットと前記突起をねじ止めすることで、前記液晶表示ユニットを前記装置本体に支持させたことを特徴とする液晶表示装置。
【発明の詳細な説明】
【０００１】
【発明の属する技術分野】本発明は、パチンコ台などの遊技用表示モニターやお風呂場に設置されるモニターやドアホンモニターや工場設備のモニター等にみられるところの液晶表示ユニット及び液晶表示装置に関する。
【０００２】
【従来の技術】液晶表示パネルにより画像を表示する液晶表示装置は、従来のブラウン管を用いて画像を表示する表示装置に比べて、軽量、小形、薄型、低消費電力が得られ易いため、表示装置としてモニター機器等の多方面に用いられている。
【０００３】従来のこの種の液晶表示装置は、図１４に示すように少なくとも液晶表示パネル８４と照明ユニット８５とを前側枠８６－１と後側枠８６－２の内に収納して成る液晶表示ユニット８７を、取付け板（装置本体）８８にねじ止めして大略構成してある。
【０００４】この場合、前記液晶表示ユニット８７の前側枠８６には、図１５及び図１６に示すように、その面部８０の上、下側縁部にそれぞれ一対の片状の取付部８１を備えており、また、面部８０の裏側には、観視窓８２の左、右方に位置させて取付ボス部８３が突設してある。また、照明ユニット８５の左、右側部位にはねじ孔８９が形成してある。ねじ孔８９に挿入したねじ部材９０を取付ボス部８３にねじ止めすることで照明ユニット８５を前側枠８６に取付ける。また、液晶表示ユニット８７は、その取付部８１のねじ孔８１Ａに挿入したねじ部材９１を取付け板８８にねじ止めして取付け板８８に取付けてある。
【０００５】
【発明が解決しようとする課題】上記した従来例にあっては、液晶表示ユニット８７を取付け板８８に取り付けるにあたって、その前側枠８６に設けた取付部８１を用いてのねじ止めであり、また、液晶表示ユニット８７を組立てるにおいて、照明ユニット８５の前側枠８６への取付けを、照明ユニット８５のねじ孔８９に挿入したねじ部材９０を取付ボス部８３にねじ止めする方法を用い

ており、液晶表示ユニット８７の取付け板８８への取付け部の構成は、構成的に複雑になると共に、組み付けに工数を要するという問題点があった。

【０００６】また、従来の液晶表示ユニット８７が有する取付部８１の張り出しに対するスペースが必要になるために、取付け板８８に、複数の液晶表示ユニット８７を横の並べて取り付ける場合に、隣り合う液晶表示ユニット８７の間隔を広くしなければならず、より多くの液晶表示ユニット８７の取り付けができないという問題点があった。

【０００７】

【課題を解決するための手段】上記の課題を解決するための本願の特徴は、照明窓を有する照明前側枠に、少なくとも蛍光管と導光部材とを収納した照明後側枠を係止手段により互いに係止して成る照明ユニットと、液晶表示パネルと、前記液晶表示パネルに表示された画像を観視するための観視窓と装置本体に組み付けるための組付け部とを有する前枠とを有して、前記前枠に前記照明ユニットと前記液晶表示パネルとを配設した液晶表示ユニットにおいて、前記照明後側枠に前枠用フックを設け、前記前枠に前記前枠用フックに掛合するキャッチャを設け、前記前枠用フックに前記キャッチャを掛合することで前記照明ユニットと前記液晶表示パネルとをユニット化したことを特徴とする。

【０００８】また、前記組付け部を、前記前枠の前記観視窓が位置する面部の側部に設けられた挿通孔と、前記照明ユニットに設けられて前記挿通孔の後方に配設された挿入孔とから構成したことを特徴とする。

【０００９】また、前記液晶表示パネルと前記照明ユニットが収納される前記前枠の収納部の少なくとも２箇所の隅には、前記照明ユニットを支持する照明ユニット支持部が配設されていることを特徴とする。

【００１０】また、前記液晶表示パネルと前記照明ユニットが収納される前記前枠の収納部の少なくとも２辺には、前記前枠の前方に配置され前記液晶パネルを支持するための装置本体から突出した突起を貫通させるための押通孔が少なくとも２箇所に配設されていることを特徴とする。

【００１１】また、前記液晶表示パネルを少なくとも２枚有する前記液晶ユニットにおいて、前記液晶表示パネルが互いに対向する面の周辺部にスペーサを介装したことを特徴とする。

【００１２】また、前記スペーサをスポンジで形成した。また、前記スペーサをウレタンゴムまたはＰＥＴ材やＰＣ材等で形成したことを特徴とする。また、前記スペーサを不織布で形成したことを特徴とする。また、前記スペーサを両面接着テープで形成したことを特徴とする。

【００１３】かかる構成により、後側枠を用いずに直接、照明ユニットを前枠に取り付けてユニット化しており、前記前枠用フックに前記キャッチャを掛合せすることにより行うことができて、ねじ止めの場合に比べて構成的に簡素になると共に、組み付けが容易になる。

【００１４】また、照明窓を有する照明前側枠に、少なくとも蛍光管と導光部材とを収納した照明後側枠を係止手段により互いに係止して成る照明ユニットと、液晶表示パネルと、前記液晶表示パネルに表示された画像を観視するための観視窓と装置本体に組み付けるための組付け部とを有する前枠とを有して、前記前枠に前記照明ユニットと前記液晶表示パネルとを配設した液晶表示ユニットを前記装置本体に組付けた液晶表示装置において、前記照明後側枠に前枠用フックを設け、前記前枠に前記前枠用フックに掛合するキャッチャを設け、前記前枠用フックに前記キャッチャを掛合することで前記照明ユニットと前記液晶表示パネルとをユニット化し、前記組付け部を、前記前枠の前記観視窓が位置する面部の側部に設けられた挿通孔と、前記照明ユニットに設けられて前記挿通孔の後方に配設された挿入孔とから構成し、前記装置本体から突出した突起を前記挿通孔に貫通させて前記挿入孔に当接し、前記照明ユニットと前記突起をねじ止めすることで、前記液晶表示ユニットを前記装置本体に支持させたことを特徴とする。

【００１５】かかる構成により前記前枠用フックに前記キャッチャを掛合せすることにより照明ユニットを前枠に取り付けてユニット化している。このため後側枠を除くことが出来、ねじ止めの場合に比べて構成が簡素になると共に、組み付けが容易になるばかりか、液晶表示ユニットを装置本体に取り付ける場合に、装置本体から突出した突起を挿通孔に貫通させて挿入孔に当接し、照明ユニットと突起をねじ止めすることにより行うことができて、従来の液晶表示ユニットが有する取付部の張り出しに対する余分なスペースが不要になって、装置本体に、複数の液晶表示ユニットを横の並べて取り付ける場合に、隣り合う液晶表示ユニットの間隔を狭くして、より多くの液晶表示ユニットの取り付けを可能にすることができる。

【００１６】

【発明の実施の形態】以下、本発明の実施の形態を図面に基づいて説明する。図１は本発明に係わる液晶表示ユニットの一部省略した分解状態の斜視図である。なお、図面においてＸ１－Ｘ２を前後方向、Ｙ１－Ｙ２を左右方向及びＺ１－Ｚ２を上下方向とする。

【００１７】本発明に係わる液晶表示ユニットＮは、前枠１と、第１の液晶表示パネル（補正セル）５とスペーサ２と第２の液晶表示パネル（駆動セル）３Ａを有する液晶パネル表示ユニット３と、照明ユニット４とより大略構成してある。そして、この液晶表示ユニットＮは、例えば、工場設備等の装置用パネル６８（図１２）に装着されて、液晶パネル表示装置としてモニタ用に使用されている。

【００１８】また、前記前枠１には、その面部１ａの中央部に、観視窓としての長方形状の画像表示窓部１Ａが形成してある。この画像表示窓部１Ａの前面側には風防ガラス１Ｂが嵌めてある。

【００１９】そして、前枠１は、図２乃至図６に示すように、その面部１ａの上、下縁部に連なる上、下面部１ｂ、１ｃと面部１ａの左、右縁部に連なる左、右面部１ｄ、１ｅとを有していて、上面部１ｂ及び左、右面部１ｄ、１ｅのそれぞれの端縁部には、それぞれ一対の係止片部１１Ａ、１１Ｂ，１２Ａ、１２Ｂ，１３Ａ、１３Ｂが形成してあり、これらの係止片部１１Ａ、１１Ｂ，１２Ａ、１２Ｂ，１３Ａ、１３Ｂには係止穴１１ａ、１１ｂ，１２ａ、１２ｂ，１３ａ、１３ｂが形成してあり、これらでキャッチャ１１、１２、１３を構成している。

【００２０】また、前記前枠１の面部１ａの裏面側には収容部６１が設けてある。この収容部６１は、前記面部１ａの裏面側を、前記画像表示窓部１Ａの前、後方に位置する上、下側部位１４Ａ、１４Ｂと、前記画像表示窓部１Ａの左、右方に位置する左、右側部位１４Ｃ、１４Ｄとし、また、上側部位１４Ａと左側部位１４Ｃとが成す角部を第１の角部１５Ａ、上側部位１４Ａと右側部位１４Ｄとが成す角部を第２の角部１５Ｂ、下側部位１４Ｂと左側部位１４Ｃとが成す角部を第３の角部１５Ｃ、下側部位１４Ｂと右側部位１４Ｄとが成す角部を第４の角部１５Ｄとした場合に、第１の角部１５Ａに第１、第２位置決めピン部１６、１７を、第２の角部１５Ｂに第３、第４位置決めピン部１８、１９を、第３の角部１５Ｃに第５、第６位置決めピン部２０、２１を、第４の角部１５Ｄに第７、第８位置決めピン部２２、２３をそれぞれ突設して構成してある。

【００２１】また、第３の角部１５Ｃにはピン状スペーサ部２４が、また、前記左側部位１４Ｃの上下にはピン状スペーサ部２５、２６がそれぞれ突設してあり、また、前記上側部位１４Ａの左右には弾性スペーサ係止用ピン部２７、２８が突設してある。

【００２２】また、左側部位１４Ｃの上下には挿通孔２９、３０が、右側部位１４Ｄの上下には挿通孔３１、３２がそれぞれ設けてあり、前枠１の面部１ａの裏面の３つに隅角部には受け部３３Ａ、３３Ｂ、３３Ｃがそれぞれ設けてあって、これらの受け部３３Ａ、３３Ｂ、３３Ｃとピン状スペーサ部２４、２５、２６で照明ユニット４を支持し、第１～第８位置決めピン部１６～２３で液晶パネルユニット３を支持し位置決めする構成をなしている。

【００２３】また、前記弾性スペーサ２は、図７に示すように板状の発泡ウレタンのようなスポンジ材を長方形状の枠状体にプレス打ち抜きして成形してあり、、その上側部位３５は幅広に成されていて、この上側部位３５の左、右には係止孔３６、３７が形成してある。この弾性スペーサ２の材質は、発泡ウレタンのようなスポンジ材に限らず、ウレタンゴム、不織布であってもよいし、弾性スペーサ２自体を両面接着テープで構成してもよい。

【００２４】前記液晶表示ユニット３は、液晶表示パネル３Ａと、液晶表示パネル３Ａの駆動制御部３Ｂとを備えている。また、液晶表示パネル３Ａは、上透明基板３ａと下透明基板３ｂとの間に液晶物質（図示せず）を封入したものである。また、液晶表示パネル３Ａには信号電極駆動回路部３９Ａと走査電極駆動回路部３９Ｂとがそれぞれ設けてある。そして、信号電極駆動回路部３９Ａと走査電極駆動回路部３９Ｂに駆動制御信号を供給するためのフラットケーブル（ＦＰＣ）４１が液晶表示パネル３Ａの透明基板に接続してある。

【００２５】また、第２の液晶表示パネル３Ａに接続された端子と反対側のＦＰＣ４１の端子は、第２の液晶表示パネル３Ａの駆動制御用の電子部品（図示せず）が実装された基板４２に接続してある。

【００２６】照明ユニット４は、図１及び図８乃至図１１に示すように蛍光管（図示せず）と導光部材（図示せず）と拡散板４Ｂとプリズムシート４Ａとを、内面が反射処理された照明後側枠５０に収納し、この照明後側枠５０の前方に、照明窓４４Ａを有する照明前側枠４４を配設すると共に、照明後側枠５０と照明前側枠４４とが係止手段（フックとキャッチャ）で互いに係止されて構成してある。

【００２７】そして、照明前側枠４４Ｌと右側部位４４Ｒの上下に切欠き部４６、４７、４８、４９がそれぞれ形成してある。また、前記照明後側枠５０の前面部の左側と右側の上下には前記切欠き部４６、４７、４８、４９に合致した形状の突起部５１、５２、５３、５４がそれぞれ形成してある。そして、これらの突起部５１、５２、５３、５４には挿入孔５１ａ、５２ａ、５３ａ、５４ａが形成してあり、突起部５１、５２、５３、５４の裏はねじ座部５１ｂ、５２ｂ、５３ｂ、５４ｂに成されている。また、前記照明後側枠５０の裏面には基板４２をねじ止めするための３本のボス部４３が設けてある。

【００２８】また、照明後側枠５０の上端面部５０Ａには、前枠係止用フックとしての係止突起５５、５６が左右に設けてあり、照明後側枠５０の左、右端面部５０Ｃ、５０Ｄには、上下に位置させて前枠係止用フックとしての係止突起５７、５８，５９、６０が設けてある。

【００２９】そして、前枠１の収容部６１に第１の液晶表示パネル５が収容してある。この場合、第１の液晶表示パネル５の第１の角部５Ａが前枠１の第１の角部１５Ａの第１、第２位置決めピン部１６、１７により、第１の液晶表示パネル５の第２の角部５Ｂが、第２の角部１５Ｂの第３、第４位置決めピン部１８、１９により位置決めされる。また、第１の液晶表示パネル５の第３の角部５Ｃが第３の角部１５Ｃの第５、第６位置決めピン部２０、２１により位置決めされる。また、第１の液晶表

示パネル５の第４の角部５Ｄが第４の角部１５Ｄの第７、第８位置決めピン部２２、２３により位置決めされる。

【００３０】そして、第１の液晶表示パネル５に重ねてスペーサ２が設けられて、このスペーサ２の上側部位３５の左、右の係止孔３６、３７にスペーサ係止用ピン部２７、２８が挿入係止される。

【００３１】そして、第２の液晶表示パネル３Ａが第１の液晶表示パネル５にスペーサ２を介して重ねて前枠１に装着される。この場合、前枠１のキャッチャ１１の係止穴１１ａ、１１ｂに照明ユニット４の前枠係止用フックとしての係止突起５５、５６が、キャッチャ１２の係止穴１２ａ、１２ｂに照明ユニット４の前枠係止用フックとしての係止突起５７、５８が、キャッチャ１３の係止穴１３ａ、１３ｂに照明示ユニット３の前枠係止用フックとしての係止突起５９、６０がそれぞれ係止される。

【００３２】そして、第２の液晶表示パネル３Ａの表側に接続されたＦＰＣ４１が折り曲げられて下方に導出して、基板４２が照明ユニット４の裏側に重ねられ、基板４２の下側縁部の左右に設けられた取付部（図示せず）をねじ部材　（図示せず）により照明後側枠５０のボス部４３にねじ止めしてユニット化してある。

【００３３】そして、このようにユニット化された液晶表示ユニットＮは装置本体６８にねじ止めされる。すなわち、この装置本体６８には、図１２に示すようにその面部６８Ａの中央部に長方形状の画像表示窓部６９が形成してあり、装置本体６８の、画像表示窓部６９を中に挟んだ左、右側部位には、上下に位置させて突起７０が突設してあり、これら突起７０の端面にはねじ孔７１が設けてある。

【００３４】そして、液晶表示ユニットＮの前枠１の挿通孔２９、３０、３１、３２に装置本体６８の突起７０を挿入して装置本体６８の裏側に液晶表示ユニットＮを沿わせる。次に、照明後側枠５０に配設されたねじ座部５１ｂ、５２ｂ、５３ｂ、５４ｂと突起７０の端面のねじ孔７１とが、照明後側枠５０に配設された挿入孔５１ａ、５２ａ、５３ａ、５４ａに挿入したねじ部材７２で、ねじ止めされる。このようにして液晶表示ユニットＮが前記装置本体６８にねじ止めされて液晶表示装置が構成される。この場合、装置本体６８の面部６８Ａの画像表示窓部６９に前記前枠１の画像表示窓部１Ａが重なる。

【００３５】

【発明の効果】以上の如く、本発明に係わる液晶表示ユニットによれば、照明後側枠に前枠用フックを設け、前枠に前記前枠用フックに掛合するキャッチャを設け、前記前枠用フックに前記キャッチャを掛合することで前記照明ユニットと前記液晶表示パネルとをユニット化したことにより、照明ユニットを前枠に取り付けてユニット化する場合、前記前枠用フックに前記キャッチャを掛合せすることにより行うことができて、ねじ止めの場合に比べて構成的に簡素になると共に、組み付けが容易になる。

【００３６】また、装置本体に液晶表示ユニットを組付けるための組付け部を、前枠の前記観視窓が位置する面部の側部に設けられた挿通孔と、照明ユニットに設けられて前記挿通孔の後方に配設された挿入孔とから構成し、前記装置本体から突出した突起を前記挿通孔に貫通させて前記挿入孔に当接し、前記照明ユニットと前記突起とをねじ止めすることで、前記液晶表示ユニットを前記装置本体に支持させたことにより、液晶表示ユニットを装置本体に取り付ける場合に、装置本体から突出した突起を挿通孔に貫通させて挿入孔に当接し、照明ユニットと突起をねじ止めすることにより行うことができて、従来の液晶表示ユニットが有する取付部の張り出しに対する余分なスペースが不要になって、装置本体に、複数の液晶表示ユニットを横の並べて取り付ける場合に、隣り合う液晶表示ユニットの間隔を狭くして、より多くの液晶表示ユニットの取り付けを可能にすることができる。

【図面の簡単な説明】

【図１】本発明に係わる液晶表示ユニットの分解状態の斜視図である。

【図２】同液晶表示ユニットの前枠の正面図である。

【図３】図２のＡ方向からの矢視図である。

【図４】図２のＢ方向からの矢視図である。

【図５】図２のＣ方向からの矢視図である。

【図６】同液晶表示ユニットの前枠の裏面図である。

【図７】同液晶表示ユニットの弾性スペーサの正面図である。

【図８】同液晶表示ユニットの照明ユニットの正面図である。

【図９】図８のＤ方向からの矢視図である。

【図１０】図９のＥ方向からの矢視図である。

【図１１】図９のＦ方向からの矢視図である。

【図１２】本発明に係わる液晶表示装置の取付状態の斜視図である。

【図１３】同液晶表示装置の取付状態の断面図である。

【図１４】従来の液晶表示装置の断面図である。

【図１５】同液晶表示装置の前枠の斜視図である。

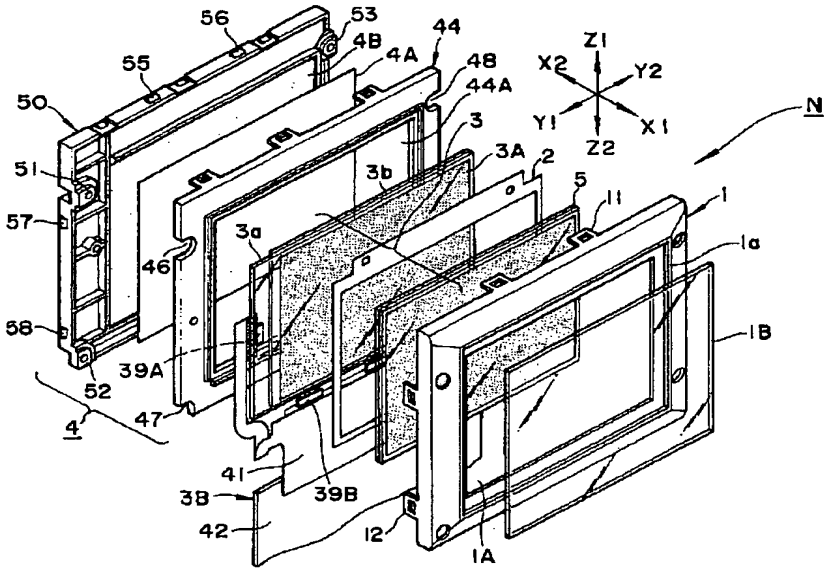
【図１６】同液晶表示装置の前枠の裏側から見た斜視図である。

【符号の説明】

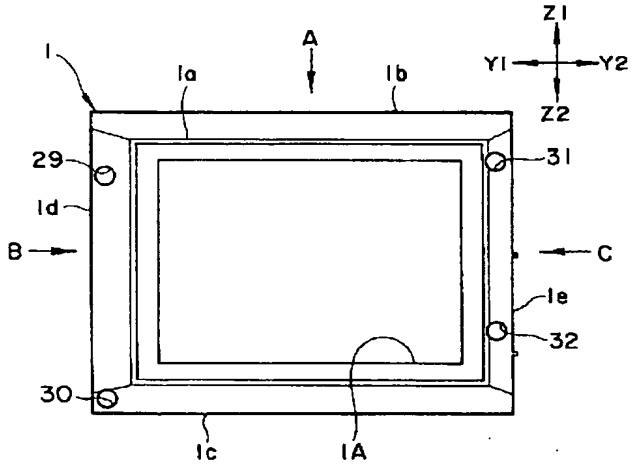
１　前枠
２　弾性スペーサ
３　液晶表示パネル
３Ａ　第２の液晶パネル
４　照明ユニット
５　第１の液晶パネル

１１、１２、１３　キャッチャ
２９～３２　挿通孔
５０　照明後側枠
５１ａ～５４ａ　挿入孔
５５～６０　係止突起（前枠係止用フック）
６８　装置本体
７０　突起
Ｎ　液晶表示ユニット

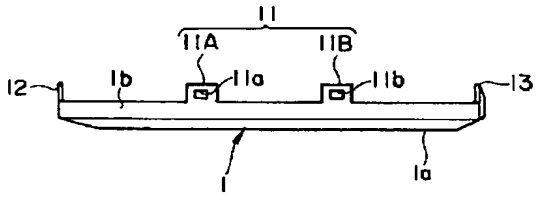
【図１】



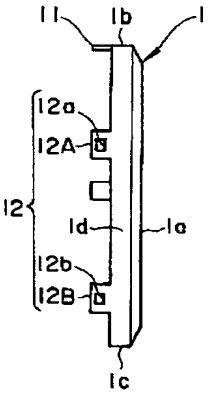
【図２】



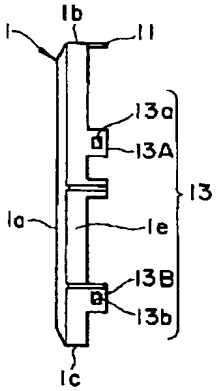
【図３】



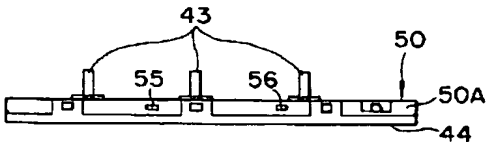
【図４】



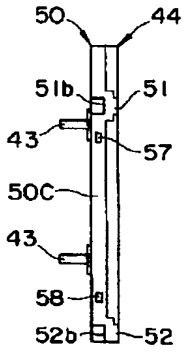
【図５】



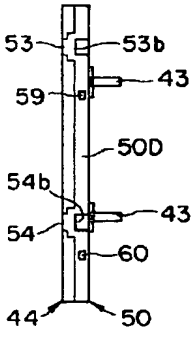
【図９】



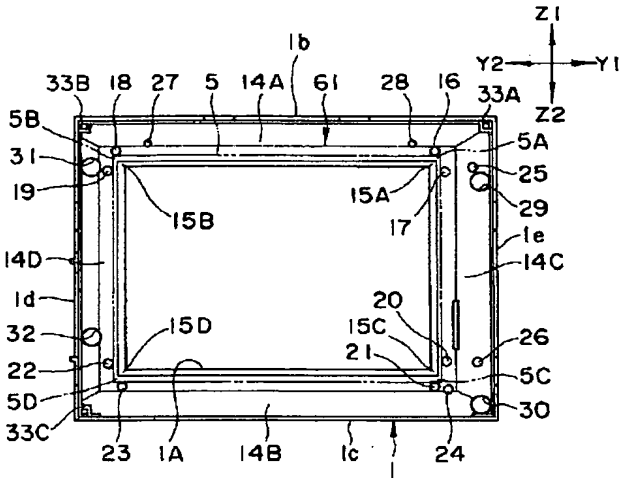
【図１０】



【図１１】



【図6】



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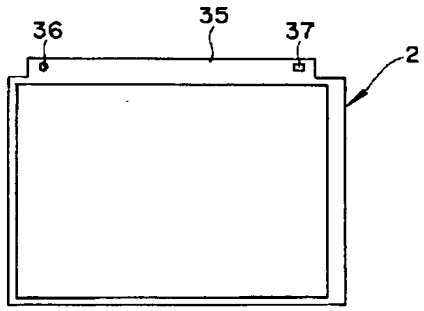
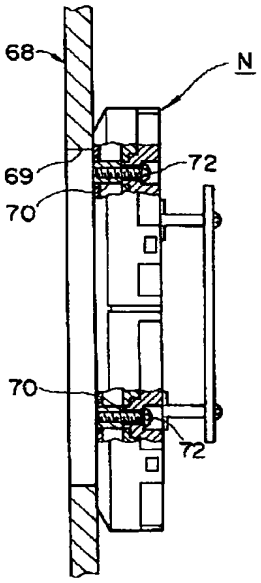


【図13】



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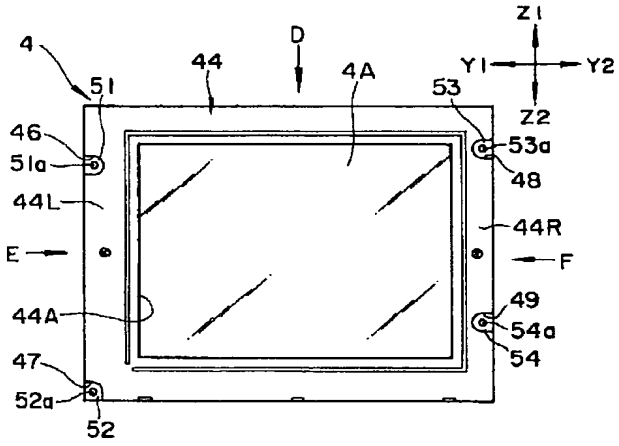
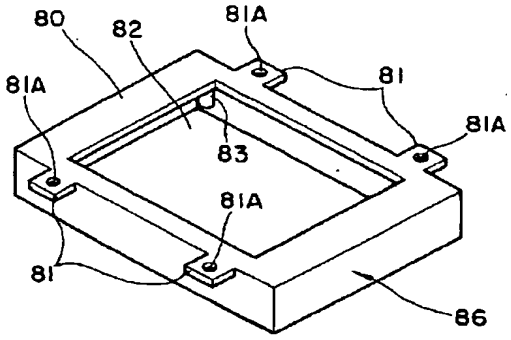
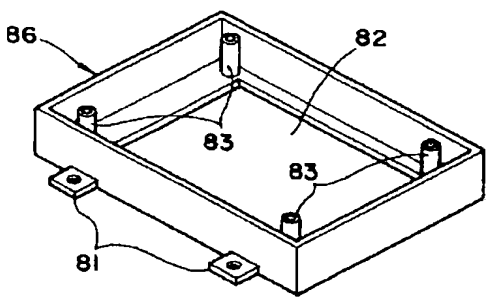


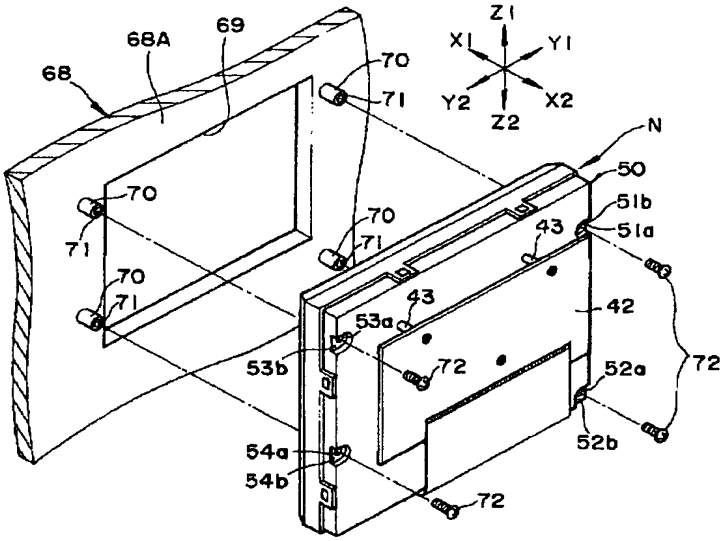
【図15】



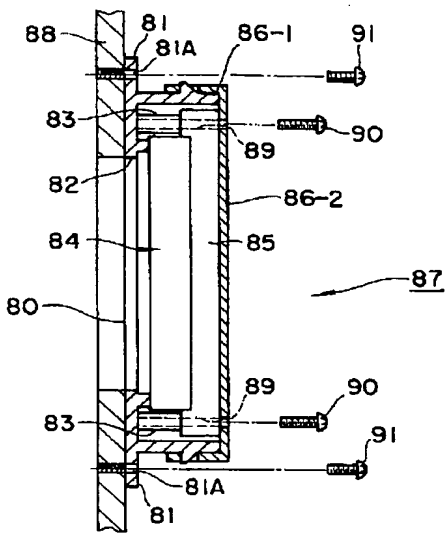
【図16】



【図12】


Z1
X1
Y1
Y2
X2
Z2
68
68A
69
70
71
N
50
51b
51a
43
42
53a
53b
72
52a
52b
54a
54b

【図14】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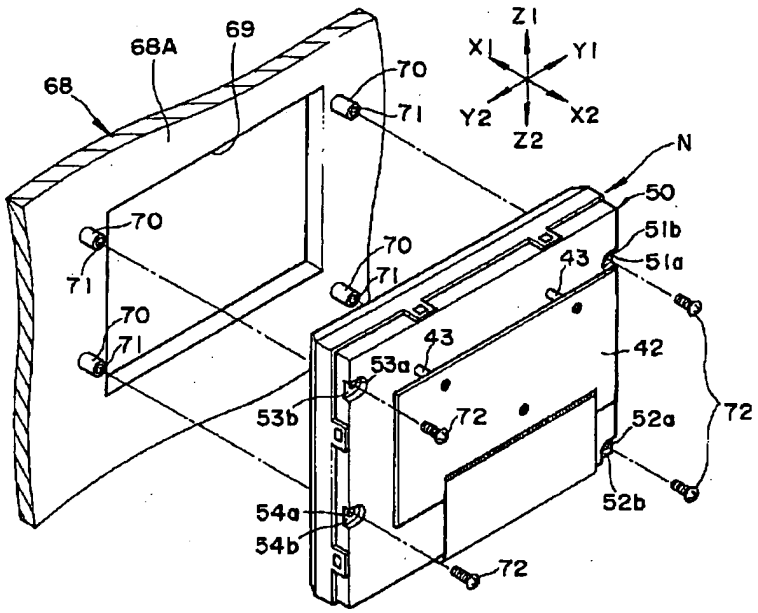
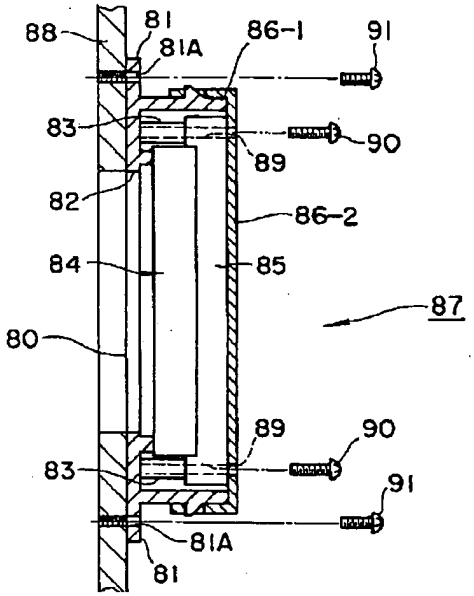
81
81A
86-1
91
83
89
90
82
86-2
84
85
87
80
81A
81



[Drawing 14]



[Translation done.]